Hansen's Disease

(Also known as Leprosy)

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1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Hansen's disease (also called leprosy) is a chronic infectious disease caused by the bacterium *Mycobacterium leprae.*

B. Clinical Description

The first bacterium to be identified as causing disease in humans in 1873, *M. leprae* has left a horrific image of human disfigurement and societal rejection dating back to the beginning of written history. The disease manifests in a clinical spectrum between two forms: lepromatous and tuberculoid leprosy. Borderline leprosy has features of both, with a tendency to shift towards the lepromatous form in the untreated patient and the tuberculoid form in the treated patient. Indeterminate leprosy is an early form that may develop into any of the other forms.

The lepromatous form of leprosy usually exhibits extensive and bilaterally symmetrical skin nodules, papules and macules and diffuse infiltration of the face, hands and feet. Nasal mucosa and ocular involvement may lead to obstructed breathing and eye inflammation. The tuberculoid form of leprosy exhibits scarce but well-demarcated skin lesions with spreading edges and a clearing center. The lesions are anesthetic or hypesthetic (have absent or reduced sensation) and are bilaterally asymmetrical. Significant peripheral nerve involvement may occur. Loss of sensation resulting from nerve involvement can lead to serious consequences including ulcerations, fractures and bone resorption.

C. Reservoirs

Humans are the only reservoir of proven significance for leprosy. There have been reports suggesting that leprosy in armadillos may be naturally transmitted to humans.

D. Modes of Transmission

The exact mechanism for the acquisition and transmission of leprosy is not known. However, household and prolonged close contact may result in transmission. Large numbers of the organism are shed in the nasal discharge of untreated lepromatous patients and the bacilli may remain viable in dried nasal secretions for at least 7 days. Large numbers of bacilli are also shed in the skin lesions in the lepromatous form of leprosy.

E. Incubation Period

The incubation period is unclear but seems to range from 9 months to 20 years.

F. Period of Communicability or Infectious Period

When cases are considered no longer "infectious" depends on the type of leprosy and the treatment prescribed. This can range from a few days to up to 3 months, and it is questionable whether the tuberculoid form of leprosy is infectious at all.

G. Epidemiology

While worldwide prevalence of leprosy decreased to less than 1 million registered cases in 1998, incidence has changed little since 1985. The majority of cases are in developing countries, with 92% in just 16 countries, led

by India and Brazil. In the United States, cases usually occur in immigrants or refugees. Although leprosy effects people of all ages and gender, cases under 3 years of age are rare.

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

A. What to Report to the Massachusetts Department of Public Health

- Any case with demonstration of acid-fast bacilli in skin or dermal nerve, obtained from the full-thickness skin biopsy.

Note: See Section 3) C below for information on how to report a case of Hansen's disease.

B. Laboratory Testing Services Available

The Massachusetts State Laboratory Institute (SLI), as well as private labs, can perform acid-fast bacillus smears. Although it is not possible to grow *M. leprae* in cell culture, further testing of specimens may be coordinated between SLI and the CDC. For more information call the SLI Mycobacteriology Laboratory at (617) 983-6381.

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify source of infection and possible modes of acquisition.

B. Laboratory and Healthcare Reporting Requirements

Please refer to the lists of reportable diseases (at the end of this manual's Introduction) for information.

C. Local Board of Health Reporting and Follow-Up Responsibilities

1. **Reporting Requirements**

Massachusetts Department of Public Health (MDPH) regulations (*105 CMR 300.000*) stipulate that each local board of health (LBOH) must report any case of leprosy (Hansen's disease), as defined by the reporting criteria in Section 2) A above. Current requirements are that cases be reported to the MDPH Division of Epidemiology and Immunization, Surveillance Program using an official CDC *Leprosy Surveillance* form (in Appendix A). Refer to the *Local Board of Health Reporting Timeline* (at the end of this manual's introductory section) for information on prioritization and timeliness requirements of reporting and case investigation.

2. **Case Investigation**

   a. It is the LBOH responsibility to complete a CDC *Leprosy Surveillance* form (in Appendix A) by interviewing the case and others who may be able to provide pertinent information. Much of the information required on the form can be obtained from the case's healthcare provider or the medical record.

   b. Use the following guidelines to assist you in completing the form:
      1) Accurately record the demographic information, dates of symptom onset and first diagnosis, and type of leprosy. Because most cases of leprosy in Massachusetts are among immigrants, there is a strong possibility that the case was previously diagnosed and possibly treated in his/her native country.
      2) Ask questions about contact with armadillos because a disease identical to leprosy affects the animals, and there have been reports suggesting that feral armadillos in Louisiana and Texas have transmitted disease to humans.
      3) Complete information about the diagnosis and current treatment. Ask questions about diagnosis to determine if the case is confirmed.

4) Ask questions about residence (*e.g.,* living outside the United States) and place of birth to determine if a person has resided or was born in a country endemic for leprosy. Complete the residence history as fully as possible.
5) Ask about household contacts and other contacts to determine the possible source of infection as well as whether others have been exposed.
6) If you have made several attempts to obtain case information, but have been unsuccessful (*e.g.,* the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as you have gathered. Please note on the form the reason why it could not be filled out completely.

c. After completing the form, attach lab report(s) and mail (in an envelope marked "Confidential") to the MDPH Division of Epidemiology and Immunization, Surveillance Program. The mailing address is:

MDPH, Division of Epidemiology and Immunization
Surveillance Program, Room 241
305 South Street
Jamaica Plain, MA 02130

Note: Do not send the form to CDC as it indicates.

d. Institution of disease control measures is an integral part of case investigation. It is the LBOH responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 4), Controlling Further Spread.

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (*105 CMR 300.200*)

Minimum Period of Isolation of Patient
No restrictions if under medical care.

Minimum Period of Quarantine of Contacts
No restrictions.

B. Protection of Contacts of a Case

Handwashing is recommended for all contacts of lepromatous cases, and disinfection of nasal discharges of the case should be considered during the infectious period. Periodic examination of household and other contacts should occur annually for 5 years after the last contact with a case.

C. Managing Special Situations

Response to Community Perceptions
Community and individual perceptions about leprosy may reflect inaccurate concerns about communicability and health implications for the diagnosed that are not valid due to the nature of the disease, treatment and prevention techniques. It is important to convey to all concerned parties the low communicability of this disease and the availability of effective treatment and prevention regimens. Likewise, strictly enforce confidentiality of case information; release information only to appropriate agencies and individuals who need to know.

D. Preventive Measures

- Education of the case should stress the availability and efficacy of therapy.

- Education of the case's household contacts (as identified on the line listing in the surveillance form; see Section 3) C, Case Investigation) should include modes of transmission, preventive therapy (if appropriate), and referral to a healthcare provider for follow-up.
- It is important to convey to the case and contacts the low communicability of this disease and the availability of effective treatment and prevention regimens.

ADDITIONAL INFORMATION

The following is the formal Centers for Disease Control and Prevention (CDC) surveillance case definition for Hansen's disease. It is provided for your information only and should not affect the investigation or reporting of a case that fulfills the criteria in Section 2) A of this chapter. (CDC case definitions are used by the state health department and CDC to maintain uniform standards for national reporting.) For reporting a case to the MDPH always use the criteria outlined in Section 2) A.

Clinical description
A chronic bacterial disease characterized by the involvement primarily of skin as well as peripheral nerves and the mucosa of the upper airway. Clinical forms of Hansen's disease represent a spectrum reflecting the cellular immune response to *Mycobacterium leprae.* The following characteristics are typical of the major forms of the disease.

- *Tuberculoid:* One or a few well-demarcated, hypopigmented, and anesthetic skin lesions, frequently with active, spreading edges and a clearing center; peripheral nerve swelling or thickening also may occur.
- *Lepromatous:* A number of erythematous papules and nodules or an infiltration of the face, hands, and feet with lesions in a bilateral and symmetrical distribution that progress to thickening of the skin.
- *Borderline (dimorphous):* Skin lesions characteristic of both the tuberculoid and lepromatous forms.
- *Indeterminate:* Early lesions, usually hypopigmented macules, without developed tuberculoid or lepromatous features.

Laboratory criteria for diagnosis
- Demonstration of acid-fast bacilli in skin or dermal nerve, obtained from the full-thickness skin biopsy of a lepromatous lesion.

Case classification
Confirmed: A clinically compatible case that is laboratory confirmed

REFERENCES

American Academy of Pediatrics. *1997 Red Book: Report of the Committee on Infectious Diseases, 24th Edition*. Illinois, American Academy of Pediatrics, 1997.

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Chin, J., ed. *Control of Communicable Diseases Manual, 17th Edition.* Washington, DC, American Public Health Association, 2000.

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